

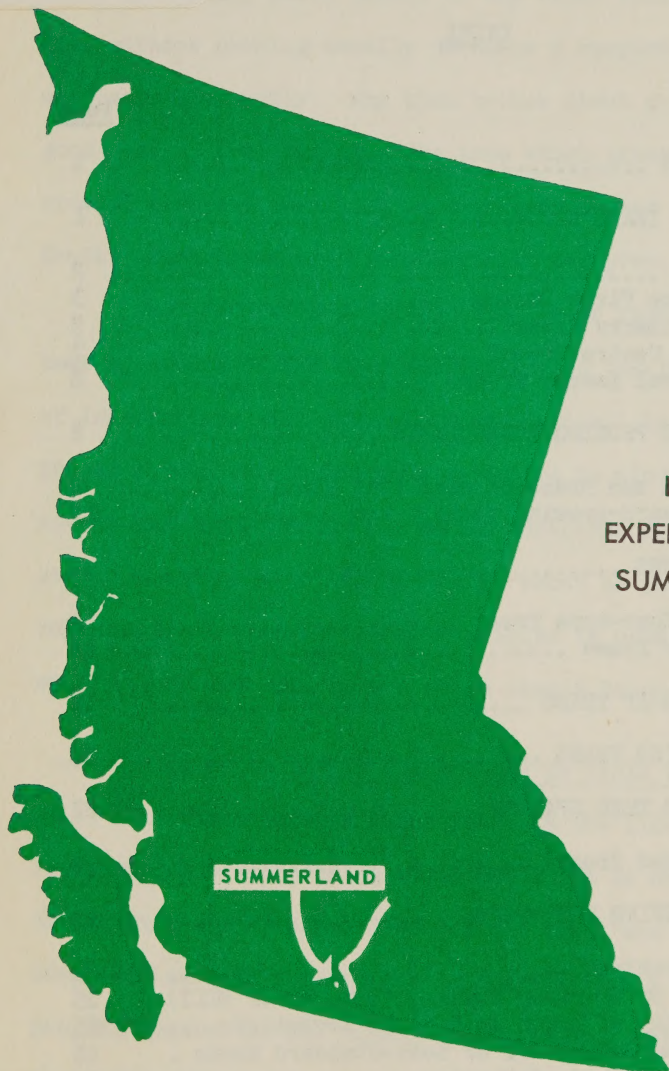
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Pruning Tree Fruits

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By

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SUMMERLAND, B.C.

CANADA DEPARTMENT OF AGRICULTURE

PRUNING TREE FRUITS AND SMALL FRUITS

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PRUNING TREE FRUITS AND SMALL FRUITS

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WHY PRUNE FRUIT TREES?

An apple, pear, cherry or any other fruit tree if allowed to grow without pruning usually develops a compact framework of branches and bears abundantly. Why then bother about pruning? There are many good reasons for pruning. The tree which grows naturally has numerous crowded branches resulting in over-bearing and small, poorly colored fruit. Such trees are also difficult to spray, thin and pick.

The purpose of pruning, then, is to regulate the shape and bearing habits of the tree and quality of the fruit, but with a minimum of interference with natural growth habits. In pruning a tree the pruner should have a definite objective in mind and a good reason for making each cut. No person should undertake pruning until he understands the purpose of the job he is about to perform. The aim of this bulletin is to present basic principles in pruning young and old trees and to point out some errors which should be avoided.

HOW TO PRUNE TREES IN EARLY YEARS

The first three or four years in the life of a tree are very important from the pruning standpoint. It is during this period that the height, shape and strength of the tree, and in considerable measure, earliness of bearing are determined. If a tree is well grown and properly pruned in the first three seasons, little pruning need be done after that until it settles into bearing.

It should always be remembered that pruning delays fruiting and the more severe the pruning the greater is the period of delay of the tree coming into full bearing. The amount of pruning that is done,

therefore, in the first few years of the tree's life should be the minimum necessary to produce a strong framework and desirable tree shape.

When apple, pear, plum or cherry trees are received from the nursery they usually are three to six foot whips with no side branches. Apricots and peaches, however, frequently have a profusion of side branches from the main stem. In either case the trees should be headed back to about three feet from the ground level. With peaches and apricots the lateral shoots may be stubbed or may be selected to provide three or four main branches. Trees should be headed at a height to make them as low set as possible and yet high enough to permit cultivation and application of trunk mouse guards. This usually works out at 30 to 36 inches. Low set trees are much cheaper to prune, thin and pick than high headed trees. Figs. 1 and 2 show a young peach tree before and after pruning.

Delayed Heading. With apples a practice commonly followed to induce wide angled crotches in shoots arising from one-year whips is known as delayed heading. When young whips are set in the orchard the first year shoots arising directly below the point of heading are frequently rather narrow angled while shoots occurring lower on the stem are wide angled. To eliminate these high branches with narrow crotches, delayed heading is often practiced. This consists of heading the whip at planting six to eight inches higher than the required height and when the terminal shoots are five or six inches long, cutting the top back six to eight inches to eliminate the shoots with the narrow angled crotches. The lower shoots on the stem, with the wider angles, will then be forced into more vigorous growth and from these shoots the ultimate framework of the tree will be selected.

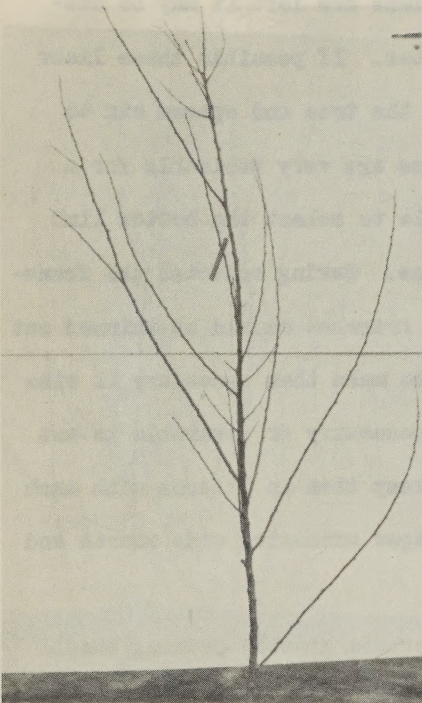


Fig. 1. Young peach tree just planted. Note numerous slender branches which will require pruning.

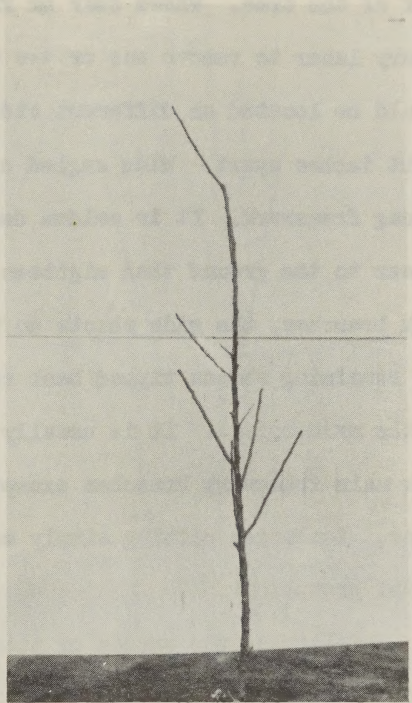


Fig. 2. Same tree as in Fig. 1 after pruning. Note many branches have been removed leaving only six which have been stubbed back. Further selection the next spring will reduce this to three or four main branches.

Pruning After the First Season. During the first summer after planting, the young tree will establish its root system, and, depending on soil moisture and fertility conditions, may make almost none to as much as four feet of growth. A good healthy tree should grow from eighteen inches to two feet.

If the tree has made abundant shoot growth during its first year, pruning the following spring should consist of selecting three to five main limbs including the leader, to form the permanent frame-

work of the tree. Where four or five limbs are left it may be necessary later to remove one or two of these. If possible these limbs should be located on different sides of the tree and spaced six to eight inches apart. Wide angled crotches are very desirable for a strong framework. It is seldom desirable to select the bottom limb closer to the ground than eighteen inches. Having selected the framework branches, the side shoots on these branches should be thinned out and remaining shoots tipped back so as to make them secondary in size to the main branch. It is usually not necessary or desirable to cut back main framework branches except to keep them in balance with each other. Excessive cutting simply encourages excessive side shoots and sucker growth.

Following the second or third season's growth, pruning should be designed to complete the establishment of a basic framework structure. Excessive shoots on the main limbs should be removed, particularly droopy slender ones or ones which grow into each other. Additional shoots occurring on the main stem should be removed, if these threaten to compete with the main framework branches.

An example of how to prune an apple tree following its second season's growth is given in Figs. 3 and 4. The framework limbs were established in the first year, and the second year's pruning shows how the surplus growth was thinned out. The tree before pruning had a height of eight feet. The top branch marked with an arrow will not be allowed to grow straight upwards, but rather, will be encouraged to develop outwards to produce what is known as a modified central leader tree. Pruning in later years will be designed to build the tree around the basic framework, removing interfering branches and tipping back terminals only enough to prevent the tree becoming willowy in form.

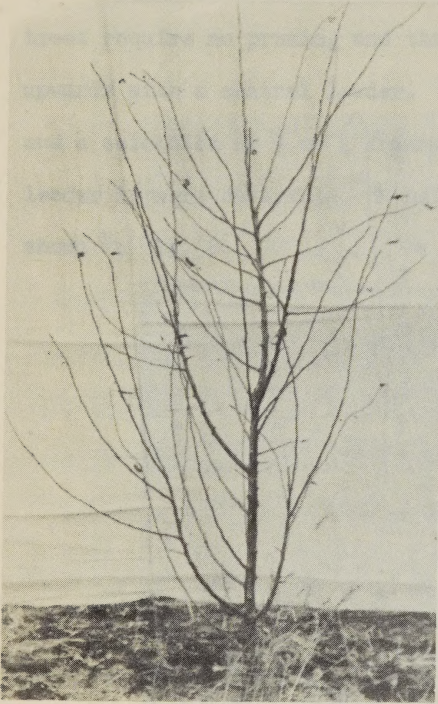


Fig. 3. Delicious apple tree after two season's growth. This tree is 8 feet tall and 4 feet in width but has too many small branches.

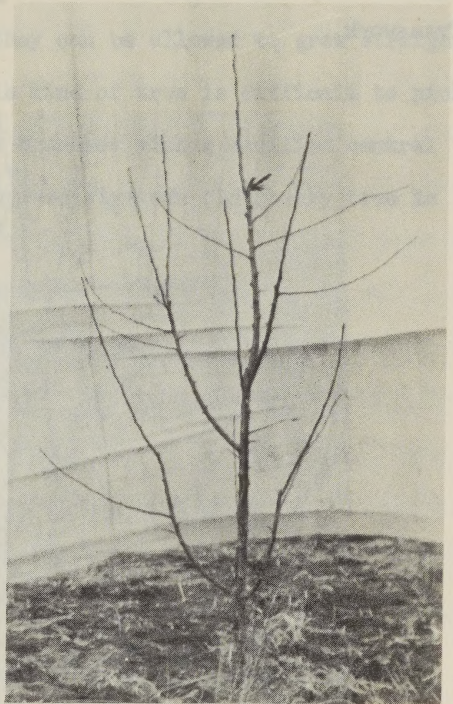


Fig. 4. The same tree as in Fig. 3 but after pruning. Pruning has consisted mainly in removing surplus branches with limited tipping back. The framework consists of 5 branches including the modified central leader.

A tree, trained on a similar system to that shown in Figs. 3 and 4 is shown in Fig. 5, this time five years from time of planting. The tree has a height of twelve feet and a spread of eight feet and is showing heavy development of fruit buds. It will be noted that there are still rather more branches left on the tree than will be needed for its ultimate permanent framework. These extra branches have been retained in the early years to provide additional fruiting wood and promote early bearing. As the years go by these unwanted branches will be

removed before they crowd the main branches and cause a spindly framework.



Fig. 5. Five-year-old Golden Delicious tree on seedling rootstock. Note strong framework including a few "extra" branches and large number of small spurs left on the tree for early fruiting. Crop on this tree was 50 pounds at 4 years from planting. Until frost of November 1955, crop potential for fifth year was 150 pounds.

Training Young Cherry Trees. It is sometimes said that cherry trees require no pruning and that they can be allowed to grow straight upwards with a central leader. This kind of tree is difficult to pick and a selection of 3 or 4 framework branches with a modified central leader is more desirable. A well pruned six-year-old cherry tree is shown in Fig. 6.



Fig. 6. Six-year-old cherry tree trained to a modified central leader. This tree will require a minimum of pruning from now on and will be easy to pick.

What About Open Centre Trees? In the training of young trees, no mention has been made of the open-centre type of pruning. This method of pruning was very popular thirty or forty years ago and is

still often used with peach trees. It is gradually going out of favor because it produces a tree with a weak crotch and because the open or vase-like centre of the tree does not make best use of the space occupied by the tree. Open centre peach and apricot trees, in particular, are especially vulnerable to splitting in this climate and once one branch splits off, usually the other two also fall apart.

On the other hand, with a modified central leader tree, where the branches come off the main trunk at different points, the loss of a single branch is not so important since the rest of the tree remains intact. A young open-centre peach tree is shown in Fig. 7 before any splitting has had a chance to develop. In Fig. 8 a slightly older apricot tree is depicted which shows what happens when one branch falls away.

What About Central-Leader Trees? Years ago central leader trees were very popular. Many of our older pear and apple orchards are pruned on this system but no one today is using central leader pruning. An example of a mature central leader pear tree is shown in Fig. 9. It is quite obvious from this illustration that the tree is hard to spray, prune, thin and pick, and moreover, because the branches tend to lie on top of each other, the quality and color of fruit suffers. It is difficult to renovate old trees started on this principle

TWO COMMON MISTAKES IN PRUNING YOUNG TREES

Two Leader Trees and Branches with Twin Limbs. Young trees after their first or second year's growth sometimes develop two main limbs of equal size. The danger in this situation is that frequently both limbs are allowed to remain because the grower feels that in removing one, he is losing half of the young tree. Actually one of

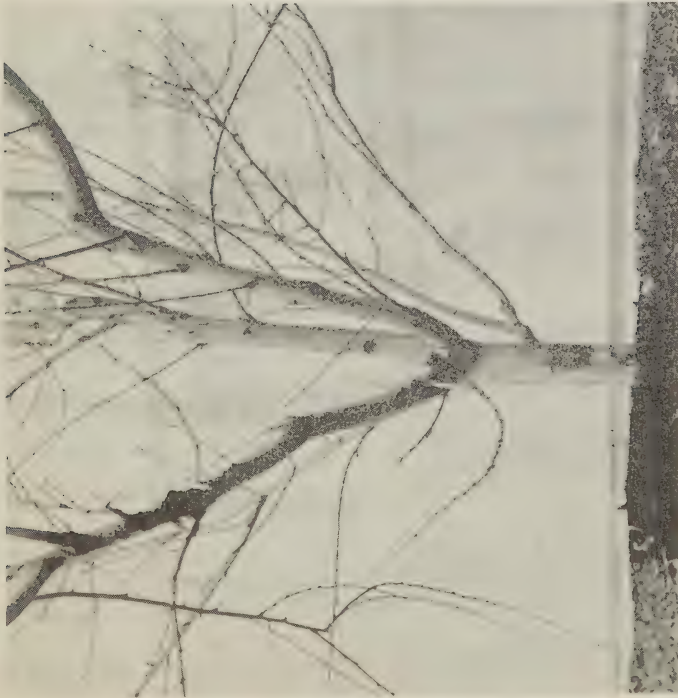


Fig. 7. Typical five-year-old open centre peach tree with three main branches. In cold climates winter injury and splitting frequently occurs with this type of crotch.



Fig. 8. This eight-year-old open centre apricot tree has suffered winter crotch damage and has fallen apart under weight of previous summer's crop. A modified central leader tree largely gets away from serious breakages.

the limbs should be removed as soon as possible since limbs of equal value usually form a bad crotch and are liable to break apart. If the competing branch is removed the tree soon recovers its size by increased growth on the one stem. An example of crotch splitting in a double stem peach tree is shown in Fig. 10.

When pruning the framework and secondary branches it is also important to avoid two limbs of equal size coming off at one point. With peaches and apricots in particular, such branches are likely to split apart as soon as the tree comes into heavy cropping. With apples, pears and other fruits the danger is not nearly so great. The solution, therefore to this problem is either to cut out one or other of these two competing branches or to shorten one back so severely that it becomes dwarfed and secondary to the remaining branch. A young apricot tree with numerous twin limbs which should have been removed is shown in Fig. 11.

Heading Back Upward-growing Young Trees. Some people become concerned about apples, pears and plums growing too much upwards and not enough outwards, and keep heading back their trees to outward-growing branches in the hope of making the tree more spreading in habit. The result usually is the development of more upward-growing shoots, excessive sucker growth and a delay in fruiting. Actually, spreading of the branches will occur with the weight of fruit from the first good crop and this does a far more effective job than any amount of pruning.

Fig. 12 illustrates a Bartlett pear tree which has been headed back a number of times in the hope of making it become more spreading. It will be noted, however, that at the point of each cut, the tree has again sent up a shoot almost directly vertical in position. This tree

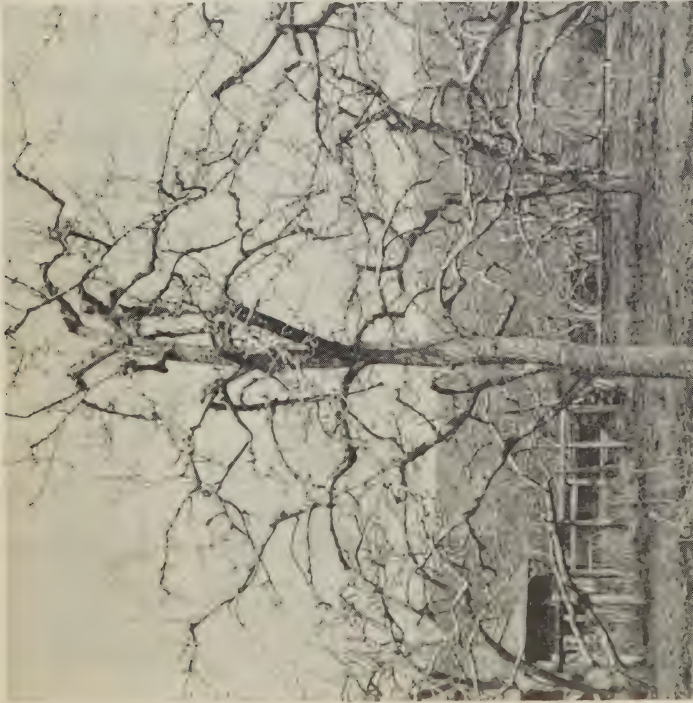


Fig. 9. Forty-year-old pear pruned on the old central leader system. Branches growing on top of each other make for difficult picking and poor quality fruit.



Fig. 10. Five-year-old peach tree trained to a framework of two main competing limbs. Note the crack forming at the crotch. This tree will require wiring to prevent it from falling apart.



Fig. 11. Eight-year-old Wenatchee Moorpark apricot showing numerous twin limbs. One limb of each twin should have been removed or shortened several years previously. It is still not too late to correct the trouble.



Fig. 12. Seven-year-old Bartlett pear tree which has been continually headed back in the hope of spreading the branches. After each cut, however, the tree has continued to grow upwards. Cutting back this tree has delayed fruiting which is the normal manner for spreading a Bartlett.

is now at the stage, judged by the abundance of fruit buds on the branches, where fruiting will bring the tree into a much more spreading condition. If this tree had not been headed back for a number of years the tree would have come into bearing much earlier and by the time this picture was taken would have already developed a spreading habit.

The foregoing remarks do not apply to young cherry, apricot or peach trees which will develop a spreading form from heading back.

HOW TO PRUNE OLDER TREES

Various purposes are served in pruning mature trees. For example, some of the bearing wood is removed to promote production of good-sized fruit and to prevent overbearing. Opening up the tree enables the sunlight to do a better job in coloring the fruit and facilitates spraying, thinning and picking. Finally, judicious pruning helps to renew and invigorate the bearing wood of the tree. Pruning by thinning out of entire branches rather than cutting back is the most desirable procedure.

Apples, pears, cherries and plums bear fruit on the same spurs for many years, whereas apricots bear only on new wood and short-lived spurs, and peaches only on new wood. Accordingly, the severity of pruning must be related to whether the tree is of the spur or non-spur type.

Pruning Mature Spur-type Trees. Pruning of apples, pears, cherries and plums is performed to keep branches from interfering with each other and to remove weak, shaded twigs which produce small, poor-quality fruit. Old fruit spurs on weak wood are also more subject to winter injury than strong vigorous spurs on new wood. Excessive sucker growth should also be removed and terminals cut back only where nec-



Fig. 13. Well pruned sixteen-year-old Bartlett pear tree. Note the tree has spread with crop and there is a good balance of fruit spurs and new wood.



Fig. 14. Well pruned mature Delicious apple tree. Because tree has had good spacing, branches have spread sideways and crop can be harvested with a 12-foot ladder.

essary to prevent the tree from becoming leggy. Examples of well-pruned 15-year-old pear and apple trees are given in Figs. 13 and 14. It will be noted that these trees are open and spreading and covered with fruit spurs. In fact the pear tree could possibly have some of the fruit spurs removed as a means of reducing the size of the crop.

Some spur removal, particularly in plums and pears may be necessary to prevent overbearing. An example of spur pruning of prunes is shown in Figs. 15 and 16. In Fig. 16 approximately one-third of the spurs on the tree have been removed, while in Fig. 15 the spur system has been left intact. The purpose for doing spur pruning on prunes and plums is to thin the crop, hasten maturity and result in fruit of higher quality. It is usually recommended for prunes that one-third of the small fruiting wood be snipped off each year. This will prevent the development of small straggly branches and encourage the formation of new vigorous fruiting wood.

In general, pruning of mature apples, plums and cherries should consist of thinning out of branches rather than snipping back. Thinning out of branches is more economical to perform than making a large number of small cuts and invigorates a wide area in the tree from which the branch has been removed. With thinning out pruning only a limited number of competing branches should be removed in any one year. Possibly with older orchards the trees will not need much thinning out oftener than every two or three years.

Branches which through heavy cropping tend to droop downwards and shade others below them should be headed back to a strong upward-growing side branch which then becomes the terminal.

Pruning Non-spur Trees. Peaches fruit only on new wood, and apricots fruit on new wood and spurs which last only two or at most three years. The fruiting wood therefore becomes located higher and



Fig. 15. Thirteen-year old Italian prune tree showing no spur or small wood pruning.



Fig. 16. Thirteen-year-old Italian prune tree after spur and small wood pruning which has resulted in removal of one-third of small fruiting branches throughout the tree.

higher in the tree and further and further out on the branches. It is therefore apparent that the stage is soon reached where the trees must be headed back to stimulate renewal of fruiting wood lower down and keep the crop within picking reach. After peaches and apricots attain an age of about eight years and a height of fifteen feet, it is desirable to head back and thin out some main branches each year to encourage development of new fruiting wood lower in the tree. This heading-back type of pruning is illustrated in Fig. 17 with a 10-year-old J.H. Hale peach tree. Unless this were done the fruiting section of the tree would soon be restricted to tops and tips of branches while the lower part of the tree would bear practically no fruit.

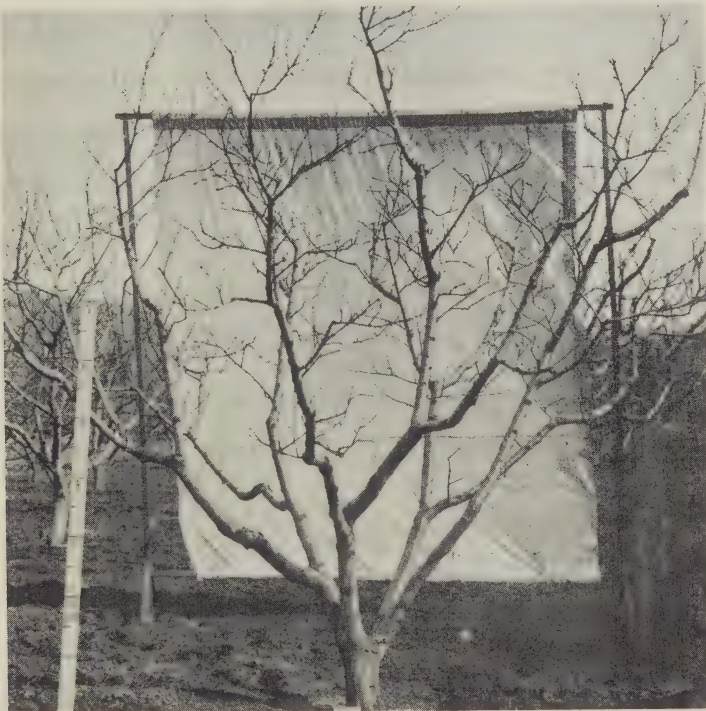


Fig. 17. Ten-year-old J.H. Hale peach tree following pruning. Note how some branches have been cut out and others headed back to stimulate production of new fruiting wood.

In addition to pruning for renewal of fruiting wood in peaches and apricots it is also necessary to thin out side shoots on new growths each year to prevent over bearing and to reduce thinning costs. The correct amount of thinning out of new shoots on a seven-year-old peach tree is demonstrated in Figs. 18 and 19. Approximately 75 per cent of the previous year's growth has been removed.

DEHORNING OLD STONE FRUIT TREES

Old peach or apricot trees are sometimes dehorned in order to renew the bearing wood as an alternative to tree removal and replanting. If the trees are sound in trunk the practice may be economically sound but should not be expected to extend the bearing life of a tree over ten years. An example of severe dehorning of an Elberta peach block is shown in Fig. 20. After dehorning of this severity a tree must grow almost an entire new system of fruiting wood, and will not be back in full bearing for three years. Moreover, heavy cutting of this kind into old wood results in cuts that often fail to heal over and renders the tree more susceptible to winter injury. A more practical method of dehorning is to start earlier in the life of the tree and cut back only part of the tree each year, thus gradually renewing the fruiting surface.

RENOVATING OLD NEGLECTED TREES

The first step consists of pruning to remove dead and dying branches and to thin out some of the remaining wood to provide space and light. An example of this is given in Figs. 21 and 22 which show a forty-year-old Northern Spy apple tree before and after pruning.

Fig. 22 shows that dead branches and only a portion of the excess fruiting wood were removed. It will be noted that whole



Fig. 18. Branch of mature peach tree before pruning showing abundant new shoot growth during previous season.

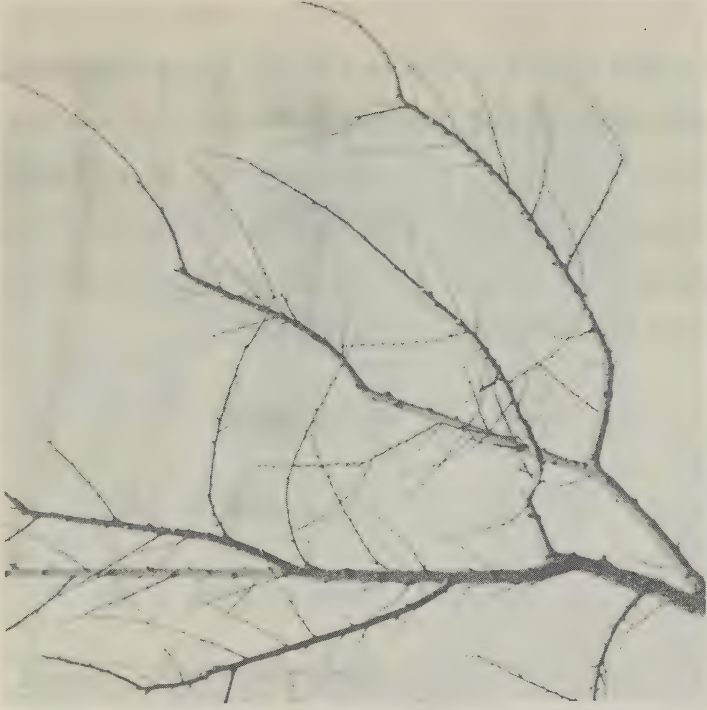


Fig. 19. Same branch as in Fig. 18 after pruning. Note extensive removal of side shoots and heading back of branches. This severity of pruning is necessary to thin the crop and promote new wood growth.

branches have been removed to open up the tree rather than making a lot of small cuts. It will take another two years to complete the renovation of this tree. It is very important to avoid pruning out too much wood in the first year. Very heavy cutting will produce excessive sucker growth and the wood may mature late in the fall making the tree more susceptible to winter injury.



Fig. 20. These 15-year-old Elberta peach trees have been dehorned in order to stimulate development of new fruiting wood. Gradual cutting back of main branches over a period of years would have been preferred.



Fig. 21. This forty-year-old apple has not been pruned for a number of years and contains dead branches and far too much fruiting wood for production of regular crops of good sized apples.



Fig. 22. The same tree as shown in Fig. 21. Note extensive thinning out of dead and crowded wood. Further cutting during the next two years will restore this tree to a profitable fruiting condition.

PRUNING IN RELATION TO TREE SPACING

Many growers plant filler rows in their orchards in order to increase production in early years. Thus apricot and apple orchards are often planted at 20 x 20 feet with the intention of removing alternate diagonal rows after ten or twelve years from planting to produce a 28 x 28 foot planting. There is no exact time for removing these filler trees except that they should come out before branches from adjacent trees start to touch.

However, many growers go a few years beyond this stage in the hope of harvesting a little bit more fruit from the planting. The result in many cases is that the trees never do get thinned out, and because the trees have no further space in which to spread sideways, new growth has to push upwards in search of light. A good example of this is shown in Fig. 23 which represents a twenty-year-old apricot orchard planted to 20 x 20 feet. It is obvious that the grower has attempted to lower the height of these trees by heavy bench cutting but the trees have responded simply by sending more sucker growth straight upwards. However, if every other diagonal row had been removed in this orchard these trees would have spread outward and made good use of the additional space thus provided. Even at this late stage tree thinning would be profitable. Trees in crowded orchards produce good fruit only on the tops where the fruit is difficult to pick, and fruit of poor size and quality in the lower parts of the tree.

Topping of Crowded Trees. With the exception of apricot and peach trees where renewal of fruiting wood is necessary, topping of crowded trees to reduce their height is not a sound procedure. Trees which have adequate space to spread sideways do not grow excessively

high. Where trees have been cut back with bench cuts, the result is excessive sucker growth, with woolly aphid infections usually following soon after. The undesirable practice of bench cutting is shown in Fig. 24. Moreover, such branches are subject to sunscald and dieback. Cuts such as these also permit the entrance of rotting organisms, and particularly the spores of the perennial canker fungus.

Another unsatisfactory method used by some growers to avoid removing overcrowded trees is to "tailor" the branches on one tree into those of the adjoining tree. This results in many heavy cuts and weakens the branches which have been shortened back. The final result is not satisfactory and soon leads to the same effect as if the trees had been chopped off on the top in order to reduce their height. "Tailored" trees, the same as trees which have been cut back on top, tend to produce low quality fruit in the under parts of the tree and good fruit only on inaccessible top branches.

TRAINING TREES ON DWARFING ROOTSTOCKS

General Considerations. The kind of pruning for trees on dwarfing rootstocks is governed by the vigor of the root and method by which trees are to be trained. In general, it should be borne in mind that trees on dwarf stocks are planted with the idea of getting early fruiting and a rapid return on the investment. Therefore, the less pruning that is done on these trees the sooner they will come into bearing and the greater will be the crop. People who are growing apples on East Malling IX, VII or IV for fillers and intend to keep them for only ten or twelve years, will not be nearly so concerned about developing a well shaped tree as people who are growing these trees for a permanent planting. Therefore, in the case of fillers, branches may be left for fruiting that might otherwise be pruned off.



Fig. 23. This vigorous 20-year-old apricot orchard has been crowded owing to a 20 x 20 foot spacing. Alternate diagonal rows should have been removed when trees started to touch. Cutting oak tops has not solved the crowding problem, but has only resulted in more top growth.



Fig. 24. Crowded McIntosh trees which have received heavy bench cutting to lower their height. This is not a good practice since large cuts seldom heal, suffer winter injury and result in heavy sucker growth. Thinning out crowded trees lowers tree height by allowing trees to spread laterally.

Then again, there are people who are growing dwarf trees in home gardens on cordons or on espaliers against houses and whose objective is to keep the tree in a small compact form by tailoring it to the available space. In cases like these the pruning may have to be more severe in order to adapt tree growth to the type of training used or space that is available.

Training Apples on Dwarfing Stocks. (E.M. IX or VIII).

Apples on dwarfing stocks E.M. IX or VIII make rapid growth in the first several years in the orchard. Because of the weak brittle root system of these dwarfs, the trees require staking or wire support, starting at planting, in order to prevent them from leaning or falling over. The trees may be headed slightly lower than standards and pruned to develop a normal framework of four or five branches. For the first few years they do not differ greatly in growth habits from trees on more vigorous roots. The trees commence to show heavy development of fruit spurs from their third year onwards and as the fruiting area of the tree is limited, spurs should be retained even in the interior of the tree. Pruning from this stage onward, then consists largely in removing interfering branches and renewing the ends of branches which may have become too drooping in habit. Occasional cutting back or thinning out of fruit spurs may be necessary in order to maintain vigorous fruiting wood. An example of a wire-supported sixteen-year-old apple on E.M. IX is shown in Fig. 25.

Hedge Row Training of Trees on E.M. IX Rootstocks. Another method for training apples on E.M. IX understocks is to plant trees closely in the row (4 foot spacing at Summerland) and to bind young contiguous branches together by intertwining or tying with string. By this method no other tree support is required, but there seems to

be a bit of a tendency for the trees to sag and to fruit too close to the ground. Hedge row training is shown in Fig. 26. This method is popular in England and a mature demonstration planting is located at the Summerland Experimental Farm.

Training Trees on Semi-Dwarf or Semi-Standard Roots. With trees grown on more vigorous stocks such as East Malling VII, IV or II, which are the most popular clonal stocks being used at the present time in the Okanagan, pruning does not differ very materially from that described for trees on standard roots. Since these trees are smaller than standard trees it must be remembered that in order to obtain maximum crops from them, as much vigorous fruiting wood should be carried by the tree as possible. Because these trees are not as large as standard trees and do not cast as much shade on inner parts of the tree, fruits located on inside spurs are usually of satisfactory size and color.

The Spindel Bush Method of Pruning. This method of pruning, also known as the Spillen type of pruning, has attracted interest in recent years in certain European countries. It is used mainly with trees on Malling IX, IV or VII roots. At planting a 3-inch post is driven into the ground to project 6 or 7 feet above the ground and act as a support for the central leader. It is quite different from the standard methods of pruning dwarf trees such as are found in England and this country, since the principle of retaining a central leader is maintained.

At the start of the second year from planting, four main branches of the first season's growth are selected and these are tied to the ground in order to force them into a horizontal position. This



Fig. 25. Sixteen-year-old apples on E.M. IX rootstocks. Note small size and compact growth habit of trees. Pruning during the bearing years has consisted mainly in renewing ends of branches which have drooped with weight of crop, plus some spur pruning.



Fig. 26. Seven-year-old McIntosh planted 4 x 15 feet for training by the hedgerow system. Very little pruning has been done and young shoots from adjoining trees have been tied together to provide tree support.

is shown in Fig. 27. By the middle of the second growing season these branches will be fixed in position and the ties which are used to hold them down may be cut. Shoots which arise from these flattened branches grow upwards but these also are tied down with wires or clothespins to the four main branches. Then the branches and shoots which later arise higher up on the main central leader or spindle are again tied down to lower branches beneath them. The spindle or central leader is allowed to reach a height of about eleven feet. This principle of tying down branches into the horizontal position results actually in very little pruning and has the effect of stimulating the development of fruit buds. Thus, for example, in Holland it is not uncommon to

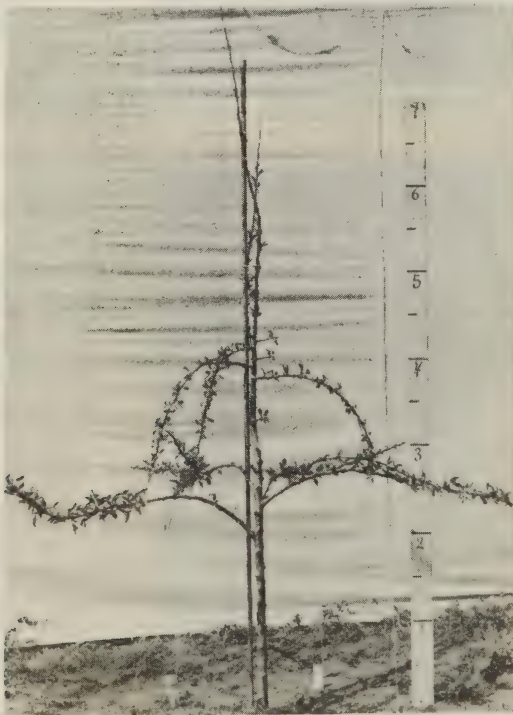


Fig. 27. Young apple tree being trained by the Spindel bush method. The central leader is tied to a stake, and at the start of the second season after planting, the main branches are tied to the ground to flatten them out and induce fruit bud formation. Upward growing shoots from the main branches and from the spindle are again tied down to the framework branches to induce fruiting.

find five-year-old trees on No. VII producing two or more boxes of fruit per tree. This is distinctly a specialized type of pruning and training, but has much to recommend it as a means for bringing about early bearing.

PRUNING SMALL FRUITS

Grapes. Grapes are commonly trained by the four or six arm Kniffin system whereby the canes are supported on two or three wires spaced at approximately $2\frac{1}{2}$, $4\frac{1}{2}$ and $6\frac{1}{2}$ feet above the ground. The most common method of training, however, is the four-arm system where only two wires are used at $2\frac{1}{2}$ and $4\frac{1}{2}$ feet from ground level. Grapes fruit only on new wood and hence it is desirable to renew the wood back as close to the main stem each year as possible. Therefore, what is required is a sturdy trunk and in the case of the four-arm system, four fruiting branches or arms taken off from this main stem as shown in Figs. 28 and 29.

The amount of wood removed in pruning, according to this illustration, seems very drastic and yet this is necessary for obtaining maximum yields of well formed bunches of good sized, early maturing fruit. Leaving more canes than are shown in Fig. 29 reduces the size and quality of the bunch and the total yield of marketable fruit. The number of buds that should be left on each of the four arms depends upon the vigor of the plant and of the variety. The variety illustrated is Patricia which is very vigorous and early maturing. It will be noted that in this case there are about thirteen or fourteen buds left on each cane. However, with later maturing varieties or varieties which are not so vigorous, ten buds is usually considered to be the correct number to be allowed on each of the four arms. It

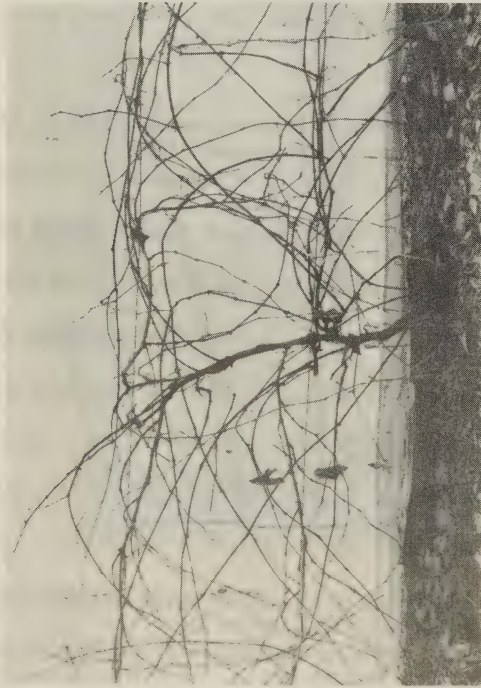


Fig. 28. Vigorous Patricia grape vine trained to the 2-arm Kniffen system, before pruning.

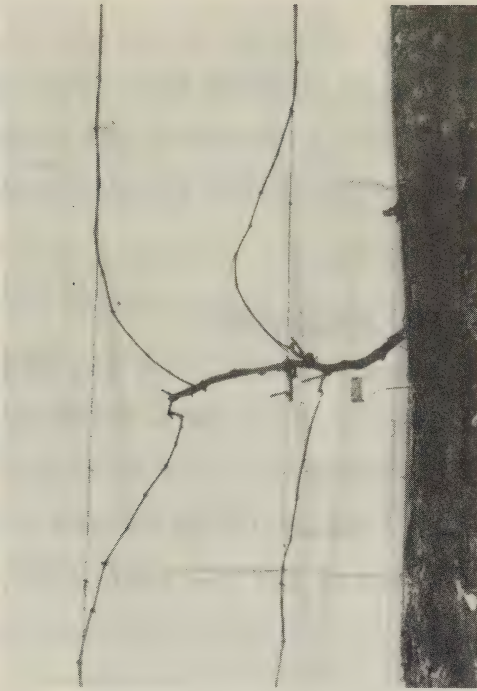


Fig. 29. Same grape vine as in Fig. 28 after pruning. Note that the fruiting wood has been renewed to four new canes, with several other branches stubbed to provide renewal canes near the trunk.

will be noted from this illustration that the canes have been removed almost back to the main stem. It will also be noted that a few stubs of canes arising from the main stem have been left. These stubs will provide strong canes for renewal of the arms in the following season.

With grapes trained on trellises the method of pruning is slightly different since here a large number of permanent arms are trained into position and in this case the fruiting canes are cut back to one or two buds each year so as to reduce the number of fruiting points and thus prevent the vine from overbearing.

Raspberries. The pruning of raspberries is very simple since they bear only on previous year's wood and the bearing canes survive only to the end of the season in which they fruit. Thus, in a raspberry planting there are two types of canes: First, those that were formed the previous year and which carry the current year's crop; and second, those canes which have grown during the present season. Many people remove the fruiting canes as soon as the crop is harvested to aid in pest control while others prefer to remove these canes during the winter or early spring. Where the last year's fruiting canes are removed during the winter and early spring they may readily be identified from the new growth by the fact that they are dead and the bark has become scaly and the stems dry and pithy.

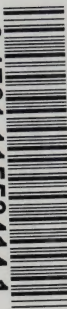
In pruning raspberries it is also desirable to remove weak and spindly canes of the previous season's growth since these do not produce good fruit and crowd the better canes and reduce the yield from them. Where there is an excessive number of strong canes it may be necessary to thin these to 6 inches apart to allow 36-40 square inches of space per cane. Any cane four or five feet in length is suitable to be retained for fruiting. As a matter of convenience in picking

it is usually desirable to trim off the tops of the fruiting canes to a height of approximately 6 feet. Excessive cane vigor may be modified by reduced nitrogen fertilization.

Currants and Gooseberries. The black currant bears most of its fruit on wood of the previous season's growth and, therefore, a plentiful supply of new wood should be left in pruning. Consequently, fruiting wood should consist only of vigorous one-year-old shoots. Pruning is therefore simply a matter of renewal of the fruiting wood. Another important reason for removing old wood in black currants is to aid in control of the cane borer.

Pruning of red currants and gooseberries is also designed to renew fruiting wood. However, these two fruits bear their best fruit on two and three-year-old wood and the pruning program, therefore, should be designed to remove wood older than this. Some thinning out of fruiting wood in red currants and gooseberries is also desirable to prevent the main fruiting branches from becoming weak and straggly.

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